

CLAIMS

What is claimed is:

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A'
- 5        1. A method for communicating between a user terminal and multiple stratospheric transponder platforms comprising the following steps:  
            maintaining stratospheric transponder platforms in a substantially fixed position with respect to a user  
10      terminal antenna coupled to a user terminal; and  
            communicating between the user terminal and at least two of the stratospheric transponder platforms concurrently.
- 15        2. The method of Claim 1 wherein the user terminal communicates with the at least two of the stratospheric transponder platforms using the same frequency band.
- 20        3. The method of Claim 1 wherein the user terminal communicates with one of the at least two of the stratospheric transponder platforms at a first data rate and with another of the at least two of the stratospheric transponder platforms at a second data rate.
- 25        4. The method of Claim 1 wherein the user terminal communicates with a first Internet router via one of the at least two of the stratospheric transponder platforms and with a second Internet router via another  
30      of the at least two of the stratospheric transponder platforms.

5. The method of Claim 1 wherein the user terminal communicates with a first media service provider via one of the at least two of the stratospheric transponder platforms and with a second media service provider via another of the at least two of the stratospheric transponder platforms.

6. A communications system for communicating between a user terminal and multiple stratospheric transponder platforms comprising:

a user terminal antenna coupled to a user terminal; and

a plurality of stratospheric transponder platforms having a substantially fixed position with respect to the user terminal antenna for communicating between the user terminal and each of the plurality of stratospheric transponder platforms concurrently.

7. The communications system of Claim 6 wherein the user terminal antenna communicates with at least two of the plurality of stratospheric transponder platforms using the same frequency band.

8. The communications system of Claim 6 wherein the user terminal antenna communicates with one of the plurality of stratospheric transponder platforms at a first data rate and with another of the plurality of stratospheric transponder platforms at a second data rate.

9. The communications system of Claim 6  
wherein the user terminal antenna communicates with one  
of a plurality of Internet routers via one of the  
plurality of stratospheric transponder platforms and with  
5 another of the plurality of Internet routers via another  
of the plurality of stratospheric transponder platforms.

10. The communications system of Claim 6  
wherein the user terminal antenna communicates with one  
10 of a plurality of communications service providers via  
one of the plurality of stratospheric transponder  
platforms and with another of the plurality of  
communications service providers via another of the  
plurality of stratospheric transponder platforms.

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11. The communications system of Claim 6  
wherein the user terminal antenna comprises:  
a single antenna reflector having a focal  
length and a focal point;  
20 and at least two feedhorns coupled to the  
single antenna reflector for forming multiple beams.

12. The communications system of Claim 11  
wherein the at least two feedhorns are coupled to the  
25 single antenna reflector at a distance substantially  
equal to the focal length and are offset from the focal  
point by a distance selected to form the multiple beams.

13. The communications system of Claim 11  
30 wherein the multiple beams are equally spaced.

14. The communications system of Claim 11  
wherein one of the at least two feedhorns is a stepped  
feedhorn.

5 15. The communications system of Claim 11  
wherein one of the at least two feedhorns is a stepped  
and tapered feedhorn.

10 16. The communications system of Claim 11  
wherein at least one of the multiple beams has a half-  
power beam width substantially equal to twice an orbit  
angle subtended by a stratospheric platform.

15 17. The communications system of Claim 11  
wherein the stratospheric transponder platforms have a  
platform spacing selected to maintain a signal-to-  
interference ratio of at least 20 dB.

20 18. The communications system of Claim 11  
wherein the stratospheric transponder platforms have an  
orbit diameter selected to maintain the stratospheric  
transponder platforms respectively near a peak of each of  
the multiple beams.

25 19. The communications system of Claim 11  
wherein the multiple beams have a spacing such that the  
signal-to-interference ratio between beams is at least 20  
dB.

20. A method for communicating between a user terminal and multiple stratospheric transponder platforms comprising the following steps:

- 5 maintaining a plurality of stratospheric transponder platforms at a substantially constant platform altitude, platform spacing, and platform orbit diameter; and  
10 communicating between each of the plurality of stratospheric transponder platforms and a user terminal on multiple beams concurrently via a user terminal antenna coupled to the user terminal.

21. The method of Claim 20 wherein the step of communicating comprises communicating between the user terminal and each of the plurality of stratospheric transponder platforms using the same frequency band.

22. The method of Claim 20 further comprising the step of separating the multiple beams such that the signal-to-interference ratio between any two of the 20 multiple beams is at least 20 dB.

25 23. The method of Claim 20 wherein the platform separation is at least two half-power beam widths.

24. The method of Claim 21 wherein the platform orbit diameter is selected to maintain each of the stratospheric transponder platforms near a peak of the multiple beams respectively.

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